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| 09/623,884 | 11/15/2000 | John Hassard | 33013-2 | 9285 |

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| ART UNIT | PAPER NUMBER |
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| 1743 | 9 |

DATE MAILED: 01/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Offic Action Summary | Application No. 09/623,884 | Applicant(s) John Hassard |
|---|---|---|
| | Examiner J. STARSIAK | Group Art Unit 1743 |

*—The MAILING DATE of this communication appears on th cover sheet beneath the correspondence address—*

**P riod for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

☒ Responsive to communication(s) filed on 15 OCTOBER 2007.

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

**Disposition of Claims**

☒ Claim(s) 1-17 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-17 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

**Application Papers**

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Pri rity under 35 U.S.C. § 119 (a)-(d)**

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

**Atta hment(s)**

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☒ Notice of Reference(s) Cited, PTO-892

☐ Notic of Draftsperson's Pat nt Drawing Revi w, PTO-948

☐ Int rview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

**Office Action Summary**

## DETAILED ACTION

### *Drawings*

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the focusing formations recited in claim 10 and further substrate of semiconductor material recited in claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "a radiation source and a radiation detector array disposed on either side of the channel array". This recitation states that the radiation source and the radiation detector.

array are on the same side of the substrate, when from the specification it is clear the these elements are on opposing sides of the substrate. Claim 10 recites, "focusing formations". However, it is unclear what limitation is intended by the term "focusing formations" since the term is not defined in the specification. The remaining claims are rejected because they depend on at least one of the above claims.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for parent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent filed by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this application of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4/1, ~~5/1~~ 5/4/1, 6, and 7 are rejected under 35 U.S.C. 102 (e) as be anticipated by Craighead.

Craighead teaches {col. 1, lines 4-11): "The present invention relates, in general, to a method and apparatus for analysis of chemical species separated by differences in flow rate

through a porous medium, and, more particularly, to a method and apparatus for analysis of such species through optical adsorption, reflection, refraction or fluorescence simultaneously through multiple micro-scale optical channels." Craighead teaches [col. 2, lines 33 & 34]: "Preferably, the optical system incorporates a carrier block which incorporates a plurality of parallel sample channels." Craighead teaches [col. 4, lines 3 & 4]: "The carrier blocks are easily replicated in plastic, glass or other transparent materials,..." Craighead teaches [col. 4, lines 52-55]: "... FIGS. 1 and 2 illustrate in diagrammatic form a microlens array 10 for optical analysis of sample material, generally located in a plurality of elongated, closely spaced, generally parallel, coplanar sample channels 12, 14, 16 and 18." Craighead teaches [col. 7, lines 60-64]: "The dimensions of the mircolens array of FIGS. 3 and 4 can be extremely small. Each sample channel can have a width w and a depth d, illustrated in FIG. 3 for channel 12, in the range of between about 1$\mu$m and 1 mm."

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Craighead in view of Swedberg et al.

Craighead discloses all the particulars recited in claims 8 and 10 except that Craighead is silent concerning the wavelength of the light source. For details of Craighead see 102 rejection above. The focusing formations recited in claim 10 read on microlenses 32, 34, 36, and 38 of Craighead. The use of UV light sources in optical detection is notoriously well known in the art. For example Swedberg et al. recites [col. 9, lines 40-59]: " An "optical detection path" refers to a configuration or arrangement of detection means to form a path whereby radiation, such as a ray of light, is able to travel from an external source to a means for receiving, wherein the radiation traverses the sample processing compartment ans can be influenced by the sample or separated analytes in the sample flowing through the sample processing compartment. In this configuration, analytes passing through the sample processing compartment can be detected via transmission of radiation orthogonal to the to the major axis of the sample processing compartment (and, accordingly, orthogonal to the direction of electroosmotic flow in an electrophoretic separation). A variety of external optical detection techniques can be readily interfaced with the sample processing compartment using an optical detection path including, but not limited to, UV/Vis, Near IR , fluorescence, refractive index (RI) and Raman techniques." It would have been obvious to one of ordinary skill in the art to use a UV light source in the device of Craighead because it is well-known than many chemical species absorb in the UV range and because it avoids interference from ambient light.

***Allowable Subject Matter***

Claims 2, 3, 4/2, 4/3, ~~5/2, 5/3~~ 5/4/2, 5/4/3, 9, 11, and 12-17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Appropriate search of the prior art failed to reveal any reference which explicitly teaches or fairly suggests an analyzer comprising: a substrate of diamond, sapphire or a polymer material; an array of elongate capillary channels formed in the substrate; means for driving a sample to be tested along the channels whereby the velocities of components of the sample along the channels depend on the relative weighs of those components; a radiation source and radiation disposed on *opposing* sides of the channel array so as to simultaneously detect the presence of material in the channels as interruptions in the radiation path between the radiation source and the radiation detector array; and one of the following particulars: 1) in which the substrate is formed of diamond, 2) in which the substrate is formed of sapphire having a coating of nanocrystalline diamond, 3) in which the radiation source comprises an ultraviolet light source operable to generate ultraviolet light at a wavelength of about 260 nm or about 200 nm, 4) in which the radiation source comprises an ultraviolet light source, focusing formations are formed on the

substrate to at least partially focus the ultraviolet light onto the interior of each channel, and the focusing formations, the channels and the ultraviolet light source are arranged so that the interior of each channel is substantially mid-way between the focusing formations and the radiation detector array, 5) in which the substrate of diamond, sapphire or polymer is formed on a further substrate of a semiconductor material, the radiation detector array being fabricated on the further substrate of semiconductor material, 6) in which the radiation detector array comprises an array of obscured regions on the substrate under the channel, and means for detecting an electric current formed by electron-hole pair generation at the obscured regions.

### *Response to Arguments*

Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fuchs et al discloses a device similar to Craighead. Fuchs et al teaches using sapphire for the covers of the device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John S. Starsiak Jr. whose telephone number is (703) 308-1797. The examiner can normally be reached on Monday to Wednesday from 8:00 AM to 3:30 PM and on Thursday and Friday from 8:00 AM to 12:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden, can be reached on (703) 308-4037. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

T. TUNG
PRIMARY PATENT EXAMINER
ART UNIT ~~112~~ 1743

John S. Starsiak Jr.
26 December 2002